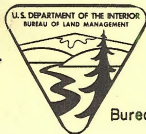


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## TECHNICAL NOTE

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Bureau of Land Management U.S. DEPARTMENT OF THE INTERIOR

### GUIDELINES FOR ESTABLISHING TRIAL SEEDING PLOTS

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#### Introduction

Plant species and species variants to be used in range restoration work must be able to establish and maintain themselves under a variety of climatic and edaphic conditions. Only adaptable sources or strains should be used to insure successful plantings. One good way of determining the suitability of plant species is to seed them in trial plots over a variety of site conditions. There are no better places to do this than within extended areas that have been prepared for seeding. Sites within these larger areas can be reserved for species testing. While it will not greatly help the seeding underway, such trials should prove extremely helpful in future seedings. After a period of a few years, it is easy to see from such trials the best suited entries and their relative merit can be quickly judged from inspection. Data from these trials may be subjected to considerable detailed statistical analyses, and in some instances this may be warranted. The following outlines a way to quickly assess adaptation.

#### Plot Arrangement

A simple arrangement of plots is desirable (Fig. 1). Also a standardized arrangement of plots is helpful for comparing values on different kinds of sites. The Intermountain Forest and Range Experiment Station, Ephraim, Utah, has found the randomized block design lends itself to being suitable for these kinds of trials on wildland areas. Ten foot long rows are adequate. A one-block layout of shrubs, grasses, and forbs is shown in Figure 2.

Additional blocks can be added; usually a minimum of two blocks is needed for statistical verification. The row numbers and species can be marked on wooden survey stakes. A coordinate layout system of plots is helpful in examining and recording data. A three digit numbering system such as 100, 200, 300, 400, etc., is helpful in numbering the rows. This makes it possible to quickly locate a plot. Species are assigned at random to the plots within blocks. Two blocks or replications should be provided to meet the minimum requirements for statistical substantiation. Where only a few species or strains are being considered, it is advisable to have more blocks. Sometimes lack of seed supplies may limit how many blocks can be provided on a site.



Figure 1 - A Simple Plot Arrangement is Desirable

|         |     |      |      |       |      |      |      |      |      |      |      |
|---------|-----|------|------|-------|------|------|------|------|------|------|------|
| Shrubs  | 100 | 101  | 102  | 103   | 104  | 105  | 106  | 107  | 108  | 109  | 110  |
|         |     | Cemo | Putr | Privi | Atac | Eula | Riau | Cema | Rofe | Cele | Cost |
| Grasses | 200 | 201  | Ager | Brin  | Agda | Agel | Agtr | Elju | Feov | Elci | Dagl |
|         |     | 301  |      |       |      |      |      |      |      |      |      |
| Forbs   | 300 | Osoc | Lile | Hebo  | Basa | Asci | Pepa | Saof | Trpo | Vima | Cova |

Figure 2 - Example Arrangement for a Trial Seeding Plot

It is best to cluster classes of plants, that is, grasses, forbs and shrubs because this permits easy comparison of classes. Also, it is good to cluster biotypes and ecotypes of a species within the block. That is, where the species randomly falls, sources, biotypes or ecotypes would be located in the immediate vicinity. This is important when comparing performance of like forms with one another. It may be desirable to compare performance between classes which can be done with this design.

#### Evaluating Plant Performance

A numerical system helps in summarizing the evaluation of plant performance. When evaluating establishment and vigor, a rating of 0 to 5 should

be used. Using this sytem, 0 is none, 1 very poor, 2 poor, 3 medium, 4 good and 5 excellent. Yield can be recorded by grams of air dry forage per plant, row, or per acre. A numerical rating system similar to the above can be used to indicate yields per acre -- 0 = 0, 1 = 100 to 200, 2 = 200 to 300, 3 = 300 to 600, 4 = 600 to 1000, 5 = 1000 plus.

#### List of Plant Species

The attached list of plant species is worthy of consideration for trial seedings in pinyon-juniper and big sagebrush vegetative types. A source of certain seed from this list may be difficult to obtain, in which case special efforts may be required to get the seed. In all trial seedings, it is important to use seed from native sources. For more information the Intermountain Forest and Range Experiment Station, Great Basin Experimental Area, Ephriam, Utah, should be contacted.

List of Species to Consider for Trial Plantings

Grasses

|                       | <u>Scientific Name</u>                     | <u>Common Name</u>      |
|-----------------------|--|-------------------------|
| AGCR <sup>F</sup>     | <u>Agropyron cristatum</u>                 | Crested wheatgrass      |
| AGDA                  | <u>Agropyron dasystachum</u>               | Thickspike wheatgrass   |
| AGIN                  | <u>Agropyron intermedium</u>               | Intermediate wheatgrass |
| AGSP                  | <u>Agropyron spicatum</u>                  | Bluebunch wheatgrass    |
| AGTR <sup>2</sup> (L) | <u>Agropyron trichophorum</u>              | Stiffhair wheatgrass    |
| BRIM                  | <u>Bromus inermis</u><br>(Southern strain) | Smooth brome            |
| BRER                  | <u>Bromus erectus</u>                      | Meadow brome            |
| DAGL                  | <u>Dactylis glomerata</u>                  | Orchard grass           |
| ELCI                  | <u>Elymus cinereus</u>                     | Great Basin wildrye     |
| ELJU                  | <u>Elymus junceus</u>                      | Russian wildrye         |
| ELSA                  | <u>Elymus salina</u>                       | Salina wildrye          |
| ELMA                  | <u>Elymus ambiguus</u>                     | Colorado wildrye        |
| FEOV <sup>D</sup>     | <u>Festuca ovina duriuscula</u>            | Hard fescue             |
| PRHY                  | <u>Oryzopsis hymenoides</u>                | Indian ricegrass        |

Forbs

|      |   |  |
|------|---|--|
| ASCI | <u>Astragalus cicer</u>                   | Sicklepod milkvetch                                      |
| ASFA | <u>Astragalus falcatus</u>                | Chickpea milkvetch                                       |
| BASA | <u>Balsamorhiza sagittata</u>             | Arrowleaf balsamroot                                     |
| COVA | <u>Coronilla varia</u>                    | Crownvetch coronilla                                     |
| HEBO | <u>Hedysarum boreale</u>                  | Sweetvetch   |
| LILE | <u>Linum lewisii</u>                      | Lewis flax   |
| MESA | <u>Medicago sativa</u>                    | Alfalfa (Ladak, Nomad,<br>Ramblar, Travois<br>and Teton) |
| MEOF | <u>Melilotus officinalis</u>              | Yellow sweetclover                                       |
| ONVI | <u>Onobrychis viciaefolia</u><br>(sativa) | Sainfoin   |
| PEPA | <u>Penstemon palmeri</u>                  | Palmer penstemon   |
| SAMI | <u>Sanguisorba minor</u>                  | Small burnet   |
| SAOF | <u>Saponaria officinales</u>              | Bouncing-bet   |
| EPGR | <u>Sphaeralcea grossulariaefolia</u>      | Gooseberryleaf globemallow                               |
| TRPO | <u>Tragopogon porrifolius</u>             | Vegetable-oyster salsify                                 |
| VIMU | <u>Viguiera multiflora</u>                | Showy goldeneye  |

Shrubs

|       |                              |                        |
|-------|------------------------------|------------------------|
| AMAL  | <u>Amelanchier alnifolia</u> | Saskatoon serviceberry |
| AMUTU | <u>Amelanchier utahensis</u> | Utah serviceberry      |
| ARTR  | <u>Artemisia tridentata</u>  | Big sagebrush          |
| ATCA  | <u>Atriplex canescens</u>    | Fourwing saltbush      |
| ATGA  | <u>Atriplex gardneri</u>     | Gardner saltbush       |

List of Species to Consider for Trial Plantings (Cont'd)

| <u>Shrubs</u> | <u>Scientific Name</u>                | <u>Common Name</u>        |
|---------------|---------------------------------------|---------------------------|
| CELE          | <u>Cercocarpus ledifolius</u>         | Curleaf mountain mahogany |
| CEMD          | <u>Cercocarpus montanus</u>           | True mountain mahogany    |
| CHNA          | <u>Chrysothamnus nauseosus</u>        | Rubber rabbitbrush        |
| CHVI          | <u>Chrysothamnus viscidiflorus</u>    | Douglas rabbitbrush       |
| COST          | <u>Cowania mexicana stansburiana</u>  | Cliffrose                 |
| CUAR          | <u>Cupressus arizonica</u>            | Arizona cypress           |
| EPVI          | <u>Ephedra viridis</u>                | Green ephedra             |
| EULA          | <u>Eurotia lanata</u>                 | Winterfat                 |
| LOTA          | <u>Lonicera tatarica</u>              | Tatrian honeysuckle       |
| PERA          | <u>Peraphyllum remosissimum</u>       | Squaw-apple               |
| PREVIM        | <u>Prunus virginiana melancocarpa</u> | Black common chokecherry  |
| PUTR          | <u>Purshia tridentata</u>             | Antelope bitterbrush      |
| RIAU          | <u>Ribes aureum</u>                   | Golden currant            |
| STOR          | <u>Symphoricarpos oreophilus</u>      | Mountain snowberry        |

Biographical References

1. Plummer, A. P., S. B. Monsen and D. R. Christensen. 1966.  
Fourwing Saltbush -- a shrub for future game ranges.  
Depart. Fish & Game, Salt Lake City, Utah. Pub. 66-4. 12p.
2. \_\_\_\_\_ . S. B. Monsen, and D. R. Christensen. 1966.  
Intermountain range plant symbols. USDA Forest Serv., Intermountain  
Forest and Range Experi. Station, Ogden. 69p.
3. \_\_\_\_\_ . D. R. Christensen and S. B. Monsen. 1968.  
Restoring big game range in Utah. Depart. Fish & Game, Salt  
Lake City, Utah. Pub. 68-3. 183p.
4. National Research Council. 1962  
Basic problems and techniques in range research. Washington, D.C.  
Pub. No. 890.

